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INTRODUCTION.

This REVIEW is based on reports for January, 1891, from 2,208 regular and voluntary observers. These reports are classified as follows: 170 reports from Signal Service stations; 118 reports from United States Army post surgeons; 1,441 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 186 reports through the Central Pacific Railway Company; 262 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Meteorological Report of Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, and Wisconsin, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR JANUARY, 1891.

Over the northwest part of the country from the Red River of the North Valley to the north Pacific coast the month was the warmest January on record. The greatest departure above the average temperature for January occurred in Montana and North Dakota, where it was more than 20°, and the month was more than 10° warmer than usual from east Washington to the upper Mississippi valley and the west part of the upper lake region. The only sections in which the month was cooler than usual were the east Gulf states, the Florida Peninsula, the southern plateau, and the west part of the middle plateau. At Fort Grant, Ariz., and Montrose, Colo., six years record, the month was the coolest January on record. The highest temperature reported by a regular station of the Signal Service was 88°, at Rio Grande City, Tex., and by a voluntary observer, 90°, at Fort Ringgold, Tex. The lowest temperature reported by a regular station of the Signal Service was —27°, at Saint Vincent, Minn., and by a voluntary observer, —36°, at Breckenridge, Colo. The first killing frost of the season was reported at Yuma, Ariz., on the 7th, at San Antonio, Tex., on the 11th, and at Titusville, Fla., on the 14th. Light frost injured vegetation near San Diego, Cal., on the 8th, at Colegrove, Cal., on the 9th, at Corpus Christi, Tex., on the 11th, and at Jupiter, Fla., on the 14th.

The monthly precipitation was the heaviest ever reported by Signal Service stations for January in parts of Maine, Vermont, Connecticut, Massachusetts, New York, New Jersey, Pennsylvania, Texas, upper Michigan, Nebraska, and southeast Wyoming, and it was the least ever noted at Detroit, Mich., at stations in Montana, in east Washington, and at San Francisco, Cal. The precipitation was in excess of the average for January in the middle Atlantic and New England states, from the west Gulf states northeastward to Kentucky, and from the Mississippi River over the middle-eastern and southeast slopes of the Rocky Mountains, and the precipitation was deficient on the Pacific coast, over the west parts of the southern and middle plateau regions, and from the north Pacific coast to the Red River of the North Valley. On the middle-eastern and southeast slopes of the Rocky Mountains more than double the usual amount of precipitation fell. On the middle and south Pacific coasts and over the middle and northern plateau regions the monthly precipitation was less than one-half of the January average. In the Ohio Valley and Tennessee, the upper Mississippi valley, the upper lake region, in the east Gulf states, and over the Florida Peninsula the precipitation averaged about the normal. In parts of Alabama, Mississippi, and Louisiana the excessive rainfall interrupted farm work and rendered the roads impassable. The greatest depth of snowfall was reported at Cumbres and Fort Lewis, Colo., and Alta, Utah, where it exceeded 50.0 inches; it exceeded 40 inches at Calais, Me., Summit Pa., and Marquette, Mich.; 30 inches at Strafford, Vt., in south-central Pennsylvania, at mountain stations in Colorado, and at Nogal, N. Mex.; and exceeded 20 inches generally in Maine and New Hampshire, in north and south Vermont, at stations in Massachusetts, west Connecticut, central and east New York, north-central Virginia, northeast Pennsylvania, upper and north lower Michigan, at Springvale, Kans., Embarrass, Wis., northeast New Mexico, west-central Idaho, and at Cisco, Cal. On the 1st a heavy snow storm prevailed in north Missouri and Kansas. On the 7th a snow storm prevailed over east Colorado, north New Mexico, Kansas, and west Nebraska, and by the 8th had extended over Missouri to Illinois. A snow storm prevailed in Indian Territory and west Texas on the 9th. A heavy snow storm was reported in Tennessee on the 24th. On the 24th and 25th great damage was caused to electric wires in the middle Atlantic and New England states by a heavy snow storm.

On the 7th a tornado occurred near Shiner and Yoakum, Tex., and on the 31st a tornado was reported at Palo Alto, Miss. A severe thunder-storm occurred at Little Rock, Ark., on the 1st; at Athol, Mass., on the 2d; and at Wellsborough, Pa., on the 29th. A severe general storm prevailed in Louisiana, Kansas, Nebraska, and Wisconsin on the 1st; over the middle and south New England states on the 11th; along the middle Atlantic and New England coasts on the 12th; along the New York and New England coasts on the 17th; along the Atlantic coast from North Carolina to Massachusetts on the 22d; and in the middle Atlantic and New England states, 25th.

On the 3d the Monongahela River was above the danger-line at Pittsburgh, Pa., and a part of Allegheny City was flooded. At Cincinnati the Ohio River rose until the 6th, flooding basements at points on the river front. Rain and

melting snow, in connection with ice gorges in streams, caused floods in Westchester Co., N. Y., on the 10th; in west New England, east New York, and east Pennsylvania on the 11th and 12th; and in west Massachusetts, Connecticut, east New York, and east Pennsylvania on the 22d. Vegetation was reported damaged by drought at San Diego and Santa Cruz, Cal., and the month was very dry at Eola, Oregon, Mount Carmel, Utah, Farley's Camp, Ariz., and Fayette, Mo. On the 5th Green Bay was frozen at Green Bay., Wis., and on the 7th the lake was frozen at Port Huron, Mich.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for January, 1891, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars. The departure of the mean pressure for January, 1891, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
New Orleans, La	+.001	Washington City	+.011
Cincinnati, Ohio	+.004	Philadelphia, Pa	+.012
Duluth, Minn	+.005	Saint Louis, Mo	−.001
Memphis, Tenn	+.005	Galveston, Tex	−.003
Cleveland, Ohio	+.007	Salt Lake City, Utah	−.008
Chicago, Ill	+.007	Santa Fé, N. Mex	−.008
Savannah, Ga	+.007	Denver, Colo	−.008
Buffalo, N. Y	+.008	Fort Assinniboine, Mont	−.013
Eastport, Me	+.008	Portland, Oregon	−.015
New York City	+.010	San Francisco, Cal	−.016
Boston, Mass	+.010	San Diego, Cal	−.020

The mean pressure was highest over adjoining parts of the middle and northern plateau regions, where it was above 30.30, whence it decreased eastward to below 29.95 over east Nova Scotia and Cape Breton Island, southeastward to about 30.15 over the Gulf States, southward to below 30.10 over the southwest part of the southern plateau and on the south Pacific coast, westward to about 30.20 on the middle Pacific coast, and northwestward and northward to below 30.10 on the extreme north Pacific coast and over the British Northwest Territory. A remarkable feature of the month was the high pressure over the middle plateau, where the mean was about .05 higher than previously noted for January within the limits of the United States.

A comparison of the pressure chart for January with that of the preceding month shows that east of a line traced from the Lake region to the southern plateau, save in Maine and the Canadian Maritime Provinces, there was a general decrease in mean pressure, and that to the westward of this line, and east of the 70th meridian, there was an increase in pressure. The most marked decrease in pressure occurred in the middle and lower Mississippi valleys and along the west Gulf coast, where it exceeded .05, and the greatest increase in pressure occurred on the north Pacific coast and at Cape Breton Island, where it was more than .15. The position of the area of highest pressure over the plateau region shifted somewhat to the northwest, with an increase of about .05 in included mean values.

The mean pressure was above the normal west of the 100th meridian, and to the eastward of that meridian it was below the normal, except over south Florida. The most marked departure above the normal occurred over the plateau region north of the 40th parallel and thence to the north Pacific coast, where it exceeded .10, and the greatest departure below the normal occurred from the middle Mississippi valley eastward to the middle Atlantic and south New England coasts, and in the interior of the Gulf States, where it was more than .05.

The monthly barometric ranges at regular stations of the Signal Service are shown in the table of Signal Service data on the last two pages of the REVIEW.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity.								
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.			Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.
High areas.		°	°		°	°	*Days.*	*Miles.*		*Inch.*			°					
I	1	48	102	5	50	63	4.0	29	Rockliffe, Ont	.86	2	Buffalo, N. Y	27	2	Port Huron, Mich	nw.	28	3
II	4	52	98	11	40	69	6.5	16	Albany, N. Y	.24	8	Father Point, Quebec	22	8	Port Arthur, Ont	nw.	24	5
III	12	30	102	15	39	71	3.5	29	do	.60	15	Northfield, Vt	25	15	Toledo, Ohio	n.	28	14
IV	14	54	114	17	46	59	3.0	36	Huron, S. Dak	.66	15	Kingston, Ont	40	16	Anticosti Island, G. S. L.	nw.	28	16
V	16	39	110	20	31	78	4.0	21	Parkersburgh, W. Va	.22	18	Nashville, Tenn	11	17	Cheyenne, Wyo	nw.	32	16
VI	22	26	84	24	44	64	2.0	36	Boston, Mass	.48	23	Raleigh, N. C	19	22	Sydney, C. B. I	sw.	30	24
VII	23	28	101	27	32	75	4.0	16	Nantucket, Mass	.60	25	Montgomery, Ala	17	24	Eastport, Me	ne.	16	27
VIII	25	50	92	27	47	59	2.0	32	Anticosti Island, G. S. L.	.26	26	Quebec, Quebec	24	26	Montreal, Quebec	ne.	16	26
IX	29	38	101	31	43	62	2.0	44	Yarmouth, N. S	.56	31	Keokuk, Iowa	18	29	Nantucket, Mass	nw.	38	31
Mean							3.4	29		.50			23				27	
Low areas.										Fall.			Rise.					
I	1	40	91	3	46	59	2.0	36	Rockliffe, Ont	.52	1	Father Point, Quebec	32	2	Grand Haven, Mich	n.	48	2
II	4	33	79	7	45	63	3.0	17	Yarmouth, N. S	.54	5	Chatham, N. B	16	5	Eastport, Me	ne.	48	5
III	6	30	107	13	47	58	7.5	20	Portland, Me	.96	12	Atlanta, Ga	22	11	Block Island, R. I	sw.	60	12
IV	12	49	115	15	49	65	3.0	35	Minnedosa, Man	.94	12	Moorhead, Minn	40	13	Fort Assinniboine, Mont.	sw.	48	12
V	14	33	105	20	49	59	6.5	22	Boston, Mass	.50	17	Sydney, C. B. I	21	18	Block Island, R. I	ne.	48	17
VI	15	49	126	19	44	78	4.5	24	Minnedosa, Man	.56	16	Valentine, Nebr	31	16	Fort Assinniboine, Mont.	sw.	52	16
VII	17	53	117	23	50	61	6.0	24	White River, Ont	.34	20	Swift Current, N. W. T	36	17	Montreal, Quebec	sw.	60	23
VIII	22	30	107	26	48	53	4.0	38	Nantucket, Mass	.80	25	Chattanooga, Tenn	13	23	Block Island, R. I	ne.	72	25
IX	23	52	116	28	42	69	4.0	25	Prince Albert, N. W. T	.46	23	Fort Assinniboine, Mont.	25	23	Valentine, Nebr	nw.	36	24
X	25	53	119	27	49	87	2.5	30	Bismarck, N. Dak	.28	26	Des Moines, Iowa	14	26	Fort Assinniboine, Mont.	sw.	36	25
XI	26	42	112	31	48	53	4.5	33	Halifax, N. S	.72	30	Chatham, N. B	18	30	El Paso, Tex	w.	48	27
XII	29	53	110	31	43	85	2.5	24	Swift Current, N. W. T	.48	29	Nashville, Tenn	25	31	Winnipeg, Man	ne.	40	30
Mean							4.2	27		.59			24				50	

AREAS OF HIGH PRESSURE.

During the month of January there was an area of marked high pressure in the region to the west of the Rocky Mountains. As will be seen by Chart II the isobar of 30.30 covers an extended region and includes a pressure of 30.35 at Winnemucca, Nev., where the highest mean January pressure previously observed was 30.26 in 1889. This permanency of high pressure in the plateau region had a very important bearing upon the weather of the entire country, causing high temperature in nearly all districts. Only one High from the Northwest Territory passed over this country. It may be considered that the Rocky Mountains formed a barrier to the progress of these